

REMARKS

The present amendment is prepared in accordance with the new revised requirements of 37 C.F.R. § 1.121. A complete listing of all the claims in the application is shown above showing the status of each claim. For current amendments, inserted material is underlined and deleted material has a line therethrough.

Applicants appreciate the thoroughness with which the Examiner has examined the above-identified application. Reconsideration is requested in view of the amendments above and the remarks below.

Claims 10 and 19 have been canceled.

For purposes of appeal, no new matter has been added.

Specification and Drawings

The Examiner has objected to the drawings under 37 CFR 1.83(a), stating that the "third thickness" recited in claim 23 must be shown in the drawings.

Applicants disagree with the Examiner since it is recited in the specification and supported in Figs. 2A-D that the "frame 22 may have the original thickness of the starting pellicle plate 10. Alternatively, if desired, once the mask 50 has been removed, such as by known methods, the frame 22 may be thinned to a predetermined or desired thickness." As such, frame 22 of Figs. 2A-D is shown with the starting pellicle thickness (i.e., first thickness), or with the thinned thickness (i.e., third thickness). (Specification, paragraph [0048]).

However, for clarification purposes only, and without adding new matter to the application since the first and third thickness' are shown in the originally filed drawings and

supported in the originally filed application (specification, paragraph [0048]), applicants have amended the specification at paragraph [0048] and amended the drawings to clarify that the frame 22 may have the original thickness 10' of the starting pellicle plate 10 (amended Fig. 2A), or it may have a thinned thickness 11' (amended Fig. 2B). A clean copy of the amended drawing sheets is attached hereto, as well as a marked-up copy showing the changes to the drawings.

No new matter has been added.

Claim Objections

The Examiner has rejected claims 10, 19, 33, and 34 due to informalities. For purposes of placing the application in a better condition for allowance, or appeal, applicants have canceled claims 10 and 19. With respect to claims 33 and 34, applicants submit that the originally filed specification makes it clear what applicants mean by the terms "vertically mounted" and "horizontally mounted." As stated in paragraph [0046] of the specification, the terms "vertical" and "horizontal" refer to the monolithic pellicle of the invention being mounted "on a vertical surface of a photomask" and "on a horizontal surface of a photomask," respectively. Accordingly, applicants submit that the terms "vertically mounted" and "horizontally mounted," when read in light of the originally filed specification, are not confusing or indefinite.

In light of the foregoing amendments and remarks, it is respectfully submitted that the objections to claims 10, 19, 33, and 34 have been overcome. No new matter has been added.

Claim Rejections - 35 USC § 103

The Examiner has rejected claims 1-3, 6, 9-17, 30 and 31-34 under 35 U.S.C. 103(a) as being unpatentable over the patent issued to Okada et al. (U. S. Patent No. 6,744,562) in view of

the patent issued to Nistler et al. (U. S. Patent No. 6,410,191). Claims 18-29 have also been rejected under 35 U.S.C. 103(a) as being unpatentable over Okada et al. in view Nistler et al.

Applicants disagree with the Examiner's rejections.

It is submitted that independent claim 1, from which claims 2, 3, 6, 9, 11-15, 31 and 32 depend, is directed to an optical pellicle that comprises a transparent plate having a recessed portion and a perimeter. The recessed portion has a first thickness, while the perimeter has a second thickness ranging from about 3mm to about 6mm. The perimeter entirely surrounds the recessed portion such that the transparent plate is a monolithic optical pellicle. Also, a plurality of openings traverse through the perimeter for introducing a gas flow over the recessed portion upon mounting the monolithic optical pellicle to a photomask. As clarified and claimed in dependent claim 13, the optical pellicle is a uniform one-piece structure.

Independent claim 18, from which claims 20-29 dependent, is directed to a method of forming an optical pellicle by providing a pellicle plate of a transparent material having a first thickness ranging from about 3mm to about 6mm, and removing a portion thereof to transform the plate into a monolithic optical pellicle. This monolithic optical pellicle includes a recessed portion that has a second thickness less than the first thickness, and a perimeter frame that entirely surrounds and is integrally formed with the recessed portion. Dependent claim 23 recites that the standoff distance between the monolithic optical pellicle and a photomask to which the pellicle is to be mounted to is adjusted for by removing a predetermined thickness from the perimeter frame.

It is further submitted that independent claim 30, from which claims 33 and 34 depend, is directed to a method of protecting a photomask during photolithography by providing a

photomask and attaching a monolithic one-piece optical pellicle having a recessed portion with a thickness ranging from about 200 μ m to about 900 μ m and a frame with a thickness ranging from about 3mm to about 6mm to the photomask. In so doing, the monolithic one-piece optical pellicle protects the photomask during subsequent photolithography processing. This monolithic one-piece optical pellicle may be mounted vertically to the photomask, or horizontally to the photomask.

With respect to the cited Okada et al. patent, the Examiner recognizes that this patent is limited to a pellicle frame and pellicle sheet that are not made of a monolithic single piece pellicle. That is, applicants continue to submit that Okada et al. is an example of the prior art at which the present invention is directed at overcoming the problems associated therewith. In more detail, Okada et al. discloses a two-piece pellicle having a box-shaped pellicle frame with top and bottom openings bonded to a pellicle sheet to cover one of the openings of the pellicle frame. (Abstract, col. 2, ll. 45-55 and col. 3, ll. 16-22.)

To overcome the deficiencies of Okada et al., the Examiner cites Nistler et al. stating that it is in the same field of endeavor and teaches a method for making a monolithic pellicle-like optical element having a perimeter of a transparent plate entirely surrounding a recessed portion. Applicants disagree with the Examiner and continue to submit that Nistler et al. is limited to forming a photomask (Abstract) ---- not an optical pellicle. Nistler merely discloses forming phase-shift masks (20, 100) by forming trenches (22, 115) in a photo-mask substrate (12, 105). The trenches have edges that define line pattern features. This is done by depositing chromium patterning layers (24, 32, 110) of appropriate width and separation on the substrate, and then etching vertical trenches (22, 115) into the photo-mask substrate using conventional etching

procedures. (Col. 1, l. 13 to col. 2, l. 3; col. 4, ll. 11-55 and Figs. 1A, 1C, 2, 3 and 4.) Nistler et al. does not disclose or contemplate forming an optical pellicle for protecting such photomask, and as such, does not disclose or contemplate a one-piece monolithic optical pellicle of a transparent plate having a recessed portion and a perimeter entirely surrounding the recessed portion

Obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either explicitly or implicitly in the references themselves or in the knowledge generally available to one of ordinary skill in the art. *In re Kotzab*, 217 F.3d 1365, 1370, 55 USPQ2d 1313, 1317 (Fed. Cir. 2000). Since Okada et al. is directed to a two-piece pellicle, and Nistler et al. is directed to forming photomasks using conventional etching techniques, there is clearly no explicit teaching within these references, alone or in combination, that would render obvious applicant's present invention of a one-piece monolithic optical pellicle.

As far as implicit teachings, applicants also submit that the record lacks sufficient evidence to support a finding of obviousness of the present invention over Okada in view of Nistler based on implicit teachings. "The test for an implicit showing is what the combined teachings, knowledge of one of ordinary skill in the art, and the nature of the problem to be solved as a whole would have suggested to those of ordinary skill in the art." *Id.* See also *In re Rouffet*, 149 F.3d 1350, 1357, 47 USPQ2d 1453, 1457-58 (Fed. Cir. 1998) ("There are three possible sources for a motivation to combine references: the nature of the problem to be solved, the teachings of the prior art, and the knowledge of persons of ordinary skill in the art.") (The

combination of the references taught every element of the claimed invention, however without a motivation to combine, a rejection based on a *prima facie* case of obvious was held improper.).

As discussed in applicants' specification, the present invention is directed at overcoming the problems associated with a conventional two-piece optical pellicle that "typically results in small distortions or stresses that can have various effects on the pellicle itself as well as the photomask being protected by such pellicle. For instance, when distortions or stresses occur as a result of attaching a frame to a mask substrate to form a hard pellicle, these distortions and/or stresses are transferred to the hard pellicle, which in turn, create optical distortions or aberrations that distort the projected light during wafer exposure. Further, such stresses may undesirably distort the reticle or even cause stress-induced birefringence or double refraction, i.e., splitting of a light wave into two unequally reflected or transmitted waves, which may result in problems with wafer printing."

Applicants submit that by taking the combined teachings of Okada et al. and Nistler et al., it would not have been obvious to one skilled in the art to adopt the teachings of Nistler et al. to modify the pellicle of Okada et al. to make a pellicle frame and pellicle sheet in a single monolithic piece. Again, Okada et al. is directed to a two-piece optical pellicle, while Nistler et al. is limited to forming a photomask by providing trenches in a substrate using conventional etch techniques. With the nature of the problems to be solved (i.e., providing an optical pellicle that prevents damage to itself and the photomask to which it is attached), the teachings of the prior art not even suggesting or contemplating a one-piece monolithic optical pellicle, and the fact that the level of skill in the art cannot be relied upon to provide the suggestion to combine references (*Al-Site Corp. v. VSI Int'l Inc.*, 174 F.3d 1308, 50 USPQ2d 1161 (Fed. Cir. 1999)),

applicants submit that the record of the present application supports a finding of non-obviousness.

In the above office action, the Examiner states that "it is really within the general skill of a worker in the art and it would have been obvious to one skilled in the art to adopt the teachings of Nistler et al. to modify the pellicle of Okada et al. to make the pellicle frame and pellicle sheet in a single monolithic piece." Applicants disagree and submit that there must be evidence that "a skilled artisan, confronted with the same problems as the inventor and with no knowledge of the claimed invention, would select the elements from the cited prior art references for combination in the manner claimed." *In re Rouffet*, 149 F.3d 1350, 1357, 47 USPQ2d 1453, 1456 (Fed. Cir. 1998); see also *In re Werner Kotzab*, 217 F.3d 1365, 1371, 55 USPQ2d 1313, 1317 (Fed. Cir. 2000).

It is submitted that the Examiner's obviousness rejected is based on improper hindsight based on reading of the instant application since the present one-piece optical pellicle, its formation, and its use for protecting a photomask includes knowledge gleaned only from applicant's disclosure. *In re McLaughlin* 443 F.2d 1392, 1395, 170 USPQ 209, 212 (CCPA 1971) ("[a]ny judgement on obviousness is in a sense necessarily a reconstruction based on hindsight reasoning, but so long as it takes into account only knowledge which was within the level of ordinary skill in the art at the time the claimed invention was made and does not include knowledge gleaned only from applicant's disclosure, such a reconstruction is proper.")

Applicants' improper hindsight position is supported by the record which is void of any prior art, or combination of prior art references, that teach, suggest, or motivate one skilled in the art at the time of the invention to do what applicants have done, namely, to provide a one-piece monolithic optical pellicle for efficiently, effectively and reliably protecting photomasks from

contamination during photolithography exposure and storage. Thus, with no motivation or teaching to combine the teachings of the prior art, it would not impel persons skilled in the art to provide the instant invention, hence, the record supports a conclusion of nonobviousness. Any contrary conclusion would be based on hindsight.

It is for these reasons that applicants continue to submit that the present invention is not obvious over Okada et al. in view of Nistler et al. Neither patent, alone or in combination, discloses, contemplates or suggests forming a one-piece monolithic optical pellicle, the resultant one-piece monolithic optical pellicle, and its use for attachment to a photomask for the protection of such photomask during lithographic processing as is currently claimed.

Accordingly, applicants submit that the application is in a condition where allowance of the case is proper. Reconsideration and issuance of a Notice of Allowance are respectfully solicited. Should the Examiner not find the claims to be allowable, applicants' attorney respectfully requests that the Examiner call the undersigned to clarify any issue and/or to place the case in condition for allowance.

Respectfully submitted,



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